

CLAIMS

1. A light-emitting element comprising:
at least a first electrode and a second electrode;
5 a first layer between the first electrode and the second electrode, said first layer including a first organic compound and a first inorganic compound that exhibits an electron accepting property to the first organic compound;
a second layer between the first layer and the second electrode, said second layer including a second organic compound that is luminescent and a second inorganic
10 compound; and
a third layer between a second layer and the second electrode, said third layer including a third organic compound and a third inorganic compound that exhibits an electron donating property to the third organic compound.
- 15 2. The light-emitting element according to claim 1, wherein the first organic compound is a hole transporting organic compound.
3. The light-emitting element according to claim 1, wherein the first organic compound is an organic compound having an aromatic amine skeleton.
- 20 4. The light-emitting element according to claim 1, wherein the third organic compound is an electron transporting organic compound.
5. The light-emitting element according to claim 1, wherein the third organic
25 compound is one of a chelate metal complex having a chelate ligand including an aromatic ring, an organic compound having a phenanthroline skeleton, and an organic compound having an oxadiazole skeleton.
6. The light-emitting element according to claim 1, wherein the first inorganic
30 compound is a metal oxide.

7. The light-emitting element according to claim 6, wherein the metal oxide is a transition metal oxide having a transition metal that belongs to any one of Groups 4 to 12 of the periodic table.

5

8. The light-emitting element according to claim 6, wherein the metal oxide is a metal oxide selected from the group consisting of vanadium oxide, molybdenum oxide, tungsten oxide, and rhenium oxide.

10

9. The light-emitting element according to claim 1, wherein the first inorganic compound is a metal nitride.

10. The light-emitting element according to claim 1, wherein the second inorganic compound is a metal oxide.

15

11. The light-emitting element according to claim 10, wherein the metal oxide is a metal oxide having a metal that belongs to any one of Groups 13 or 14 of the periodic table.

20

12. The light-emitting element according to claim 10, wherein the metal oxide is a metal oxide selected from the group consisting of aluminum oxide, gallium oxide, silicon oxide, and germanium oxide.

13. The light-emitting element according to claim 1, wherein the second inorganic compound is a metal nitride.

25

14. The light-emitting element according to claim 1, wherein the third inorganic compound is a metal oxide.

30

15. The light-emitting element according to claim 14, wherein the metal oxide

is one of an alkali metal oxide, an alkali-earth metal oxide, and a rare-earth metal oxide.

16. The light-emitting element according to claim 14, wherein the metal oxide is one of lithium oxide and barium oxide.

5

17. The light-emitting element according to claim 1, wherein the third inorganic compound is a metal nitride.

18. The light-emitting element according to claim 17, wherein the metal oxide
10 is one of an alkali metal nitride, an alkali-earth metal nitride, and a rare-earth metal nitride.

19. The light-emitting element according to claim 17, wherein the metal nitride
15 is a metal nitride selected from the group consisting of lithium nitride, magnesium nitride, and calcium nitride.

20. A light-emitting element comprising:

at least a first electrode and a second electrode;

a first layer between the first electrode and the second electrode, said first layer
20 including a first organic compound and a first inorganic compound that exhibits an electron accepting property to the first organic compound;

a second layer between the first layer and the second electrode, said second layer including a second organic compound that is luminescent and a second inorganic compound;

25 a third layer between the second layer and the second electrode, said third layer including a third organic compound and a third inorganic compound that exhibits an electron donating property to the third organic compound; and

a fourth layer between the third layer and the second electrode, said fourth layer including a fourth organic compound and a fourth inorganic compound that
30 exhibits an electron accepting property to the fourth organic compound.

21. The light-emitting element according to claim 20, wherein at least one of the first organic compound and the fourth organic compound is a hole transporting organic compound.

5

22. The light-emitting element according to claim 20, wherein at least one of the first organic compound and the fourth organic compound is an organic compound having an aromatic amine skeleton.

10

23. The light-emitting element according to claim 20, wherein the third organic compound is an electron transporting organic compound.

24. The light-emitting element according to claim 20, wherein the third organic compound is one of a chelate metal complex having a chelate ligand including an aromatic ring, an organic compound having a phenanthroline skeleton, and an organic compound having an oxadiazole skeleton.

15

25. The light-emitting element according to claim 20, wherein at least one of the first inorganic compound the fourth inorganic compound is a metal oxide.

20

26. The light-emitting element according to claim 25, wherein the metal oxide is a transition metal oxide having a transition metal that belongs to any one of Groups 4 to 12 of the periodic table.

25

27. The light-emitting element according to claim 25, wherein the metal oxide is a metal oxide selected from the group consisting of vanadium oxide, molybdenum oxide, tungsten oxide, and rhenium oxide.

28. The light-emitting element according to claim 20, wherein at least one of the first inorganic compound the fourth inorganic compound is a metal nitride.

30

29. The light-emitting element according to claim 20, wherein the second inorganic compound is a metal oxide.

5 30. The light-emitting element according to claim 29, wherein the metal oxide is a metal oxide having a metal that belongs to any one of Groups 13 or 14 of the periodic table.

 31. The light-emitting element according to claim 29, wherein the metal oxide
10 is a metal oxide selected from the group consisting of aluminum oxide, gallium oxide, silicon oxide, and germanium oxide.

 32. The light-emitting element according to claim 20, wherein the second
15 inorganic compound is a metal nitride.

 33. The light-emitting element according to claims 20, wherein the third inorganic compound is a metal oxide.

 34. The light-emitting element according to claim 33, wherein the metal oxide
20 is one of an alkali metal oxide, an alkali-earth metal oxide, and a rare-earth metal oxide.

 35. The light-emitting element according to claim 33, wherein the metal oxide is one of lithium oxide and barium oxide.

25 36. The light-emitting element according to claim 20, wherein the third inorganic compound is a metal nitride.

 37. The light-emitting element according to claim 36, wherein the metal oxide
30 is one of an alkali metal nitride, an alkali-earth metal nitride, and a rare-earth metal nitride.

38. The light-emitting element according to claim 36, wherein the metal nitride is a metal nitride selected from the group consisting of lithium nitride, magnesium nitride, and calcium nitride.

5

39. The light-emitting element according to claim 1, wherein the light emitting element is incorporated in an electronic appliance selected from the group consisting of a video camera, a digital camera, a goggle-type display, head mount display , a navigation system, a sound reproduction device, an in-car audio system, a audio component, a personal computer, a game machine, a personal digital assistance, a
10 mobile computer, a cellular phone, a portable game machine, an electronic book, and an image reproduction device equipped with a recording medium.

40. The light-emitting element according to claim 20, wherein the light
15 emitting element is incorporated in an electronic appliance selected from the group consisting of a video camera, a digital camera, a goggle-type display, head mount display , a navigation system, a sound reproduction device, an in-car audio system, a audio component, a personal computer, a game machine, a personal digital assistance, a mobile computer, a cellular phone, a portable game machine, an electronic book, and an
20 image reproduction device equipped with a recording medium.